

RFP #

STATEMENT OF WORK

Multicore Fiber with DTG's

Program Office



National Aeronautics and Space Administration
Dryden Flight Research Center
Edwards, California

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1.0 Background

NASA Dryden is pursuing the development and fabrication of a multicore fiber optic structure containing "all-grated" fiber optic cores. This unique fiber will be used to measure three-dimensional shape on which the fiber structure is placed. Special shape algorithms have been developed by Dryden to make use of this fiber in order to render this shape.

NASA is interested in measuring shape of various types of structures ranging from spacecraft's to airplanes, from building to simple or complex structures. This shape information can be fed back into a control computer to adequately control the shape of a structure using appropriate actuators. With next generation morphing vehicles on the drawing boards, technology such as this will play a major enabling role of achieving adaptability of wing shape.

2.0 Objectives

The objective of this contract will be to develop a four core optical fiber with three of the core positioned on the outer circumference at 120 degrees apart from each other and the fourth core on the centerline of the fiber structure. All four cores shall be written with Bragg gratings, each 9mm long separated by 1mm of space. The fiber structure shall be encapsulated with a durable coating for operation in harsh environments. This structure will be used to measure 3-D shape of structures, like those alluded to above.

3.0 Requirements

The multicore fiber structure shall provide 4 cores, 3 of which are located in the outer portion of the fiber and 1 at the centerline. The 3 outer core fibers will be separated from each other by 120 degrees, and no more than 70um from the center. The cladding material shall be pure silica with an overall thickness of 330um. Over the cladding material shall be Ormocer (operating range -180C to 200C) coating with a thickness of 70um. Each fiber in the structure shall be "all-grated" fiber with Bragg gratings along the length of the fiber. The gratings shall be separated on each fiber by 1mm and each grating being 9mm long. All the gratings shall be written at the same wavelength of 1550nm with a reflectivity of no more than 0.01%.

The contractor shall provide the appropriate fan-out to breakout the four cores to four single core, single mode cables (1 meter long) with FC/APC connectors.

4.0 Deliverables

The contractor shall provide the 120m of multicore fiber along with 2 fan-out units. The 120m length of fiber shall be split into 8, 15m long segments with each segment have connectors on both ends.

5.0 Period of Performance

Period of performance shall be no longer than 16 weeks after receipt of order for NASA. This timeframe may change upon mutual agreement between the contractor and the contracting officer technical representative.

6.0 Travel

This contract will not provide any travel.

7.0 Other Special Requirements and Considerations

This contract does not require any special requirements or considerations.

REVISIONS

Revision Number	Date	Brief Summary of Changes
Base		
1		
2		
3		
4		
5		
6		
7		
8		